

Supporting Information

Photo-driven Pulsating Vesicles

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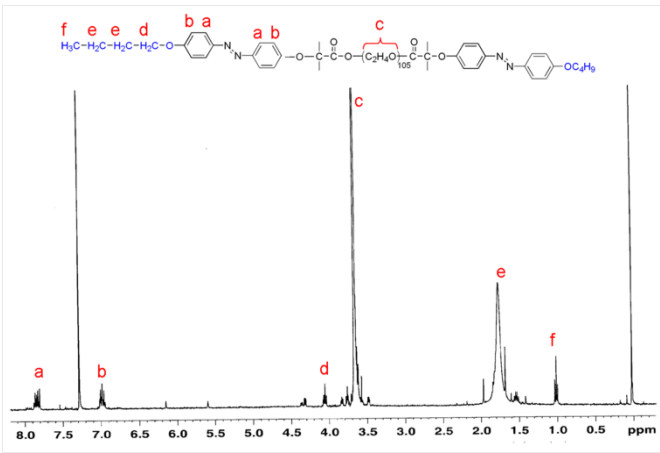


Fig. S1 ¹H-NMR spectrum of (C₄H₉O-Azo)₂-PEG in CDCl₃

Table S1 DLS results of the self-assembly behavior for (C₄H₉O-Azo)₂-PEG in THF/water mixed solvent with different volume ratios (Values are mean ± SD)

THF / water	1:10	1:9	1:8	1:7	1:6	1:5	1:4	1:3	1:2	1:1
	DLS test done on the 1 st day when the vesicles are prepared									
<i>D_h</i> (nm)	239±15	273±16	262±50	405±22	432±32	545±29	501±9	538±154	618±112	1003±68
PDI	0.13±0.1	0.15±0.02	0.16±0.1	0.13±0.05	0.11±0.05	0.07±0.05	0.05±0.01	0.1±0.1	0.14±0.1	0.3±0.1
	DLS test done 30 days after the vesicles are prepared									
<i>D_h</i> (nm)	201±28	248±26	217±25	608±32	502±27	580±25	524±8	675±52	754±42	1415±210
PDI	0.22±0.1	0.21±0.1	0.24±0.05	0.25±0.1	0.26±0.1	0.19±0.05	0.14±0.05	0.15±0.1	0.27±0.1	0.33±0.2

Table S2 Summary of Laser Light Scattering Results^a

Sample	R_h (nm)	R_g (nm)	R_g/R_h	M_w g/mol (aggregates)	M_w g/mol (polymer)	$N_{\text{aggregation}}^b$
(H-Azo) ₂ -PEG	252	299	1.19	7.43×10^7	7.69×10^3	1.03×10^4
(CN-Azo) ₂ -PEG	273	334	1.22	7.95×10^7	7.75×10^3	1.03×10^4
(C ₄ H ₉ O-Azo) ₂ -PEG	250	318	1.27	8.20×10^7	7.93×10^3	1.05×10^4

^a Test on dark-adapted samples; ^b $N_{\text{aggregation}} = M_w(\text{aggregates})/M_w(\text{polymer})$, where the values of $M_w(\text{polymer})$ are from GPC analysis.

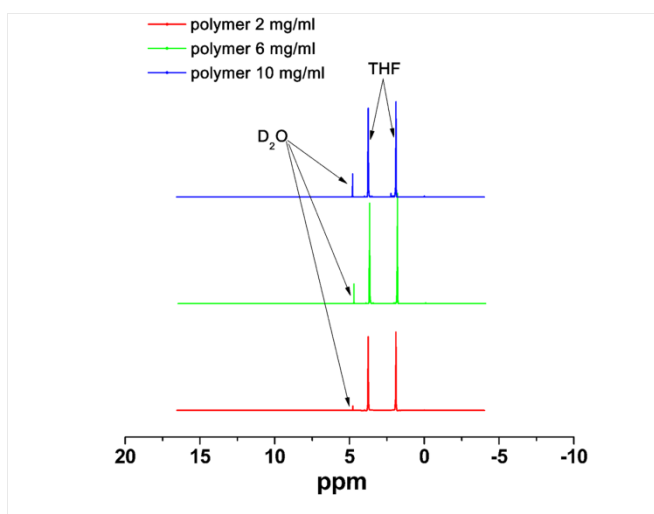


Fig. S2 ¹H NMR spectra changes of (C₄H₉O-Azo)₂-PEG polymer in THF/D₂O (vol 1:4) with different polymer concentrations. The signal at δ 4.8 ppm is assigned to D₂O; the signal at δ 3.7 ppm and 1.8 ppm are assigned to THF.

Table S3 Summary of ^1H NMR Results of **Fig. S2**

Polymer Concentration	$I_1 : I_2 : I_3^*$	I_2 / I_1 (or I_2 / I_3)
2 mg/ml	0.01 : 1 : 1	100
6 mg/ml	0.03 : 1 : 1	33
10 mg/ml	0.06 : 1 : 1	17

* The I_1 (at $\delta 4.8$ ppm, D_2O), I_2 (at $\delta 3.7$ ppm, THF) and I_3 (at $\delta 1.8$ ppm, THF), are the integral peak intensities of D_2O and THF.